

***Title: An introduction to the Ionospheric response to magnetic storms***

**Abstract:** The physical interaction of the interplanetary medium with the Earth's magnetosphere generates a variety of global processes in the Magnetosphere-Ionosphere-Thermosphere- System (MITS). The effects of magnetospheric processes, though direct and dramatic at high latitudes, are not confined to that region alone, but extend to lower latitudes as well, particularly during disturbed geomagnetic conditions because of the electrodynamical/dynamical coupling of high latitude-low latitude thermosphere-ionosphere system. During storms, the magnetosphere is structurally changed and the underlying F-region is affected particularly by enhanced electrodynamic drifts and changes in the flow of plasma between the ionosphere and magnetosphere. Moreover, the prompt penetration of magnetospheric electric fields into the midlatitude ionosphere induces variations in Total Electron Content (TEC), steep spatial gradients in ionospheric plasma parameters and scintillations at mid-and low latitudes that may adversely affect the performance of navigation systems. One of the most important requirements for the space weather community is to improve ionospheric predictions for HF radio communications even during disturbed conditions in the ionosphere because the radio frequency signals passing through the ionosphere and ground based communication systems are affected most under storm time ionospheric disturbance conditions. Some of these aspects are discussed here.